

46, 48 and 56, 58 may match identically or they may be different, in either case, however, the metallization patterns 46, 48 and 56, 58 are arranged so that when they are solder bonded together optical device 44 and optical element 52 are aligned. Optical element 52 may include a device-side optical lens 60 and a fiber-side optical lens 62. Optical lenses 60, 62 may be diffractive or refractive optical lenses formed on an optical substrate 64 (e.g., a glass substrate). Optoelectronic device 10 further includes a plurality of solder bumps 66 disposed between the metallization patterns 46, 48 and 56, 58. During manufacture, solder bumps 66 originally are disposed on metallization pattern 56, 58 of optical lens system 50. Optical device substrate 42 is aligned with optical substrate 64 to within an accuracy required for solder bumps 66 to contact the metallization pattern 46, 48 of optical device system 40. The assembly then is raised to a temperature at or above the melting point of solder bumps 66. Solder bumps 66 wet the solderable metallization pattern 46, 48 and surface tension forces pull optical substrate 64 and optical device substrate 42 in very precise alignment (e.g., to within $\pm 4 \mu\text{m}$). The assembly is cooled to form a solidly bonded, accurately aligned structure. This bonded structure may be incorporated into a header block of a transceiver module and aligned with the optical fibers of a fiber optic ribbon interconnect using conventional ferrule-based alignment technology.--

In the claims:

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Please cancel claims 1 and 2 without prejudice.

3. (Amended) An optoelectronic device, comprising:

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an optical device system comprising an optical device substrate supporting one or more optical devices and a solderable metallization pattern having a spatial arrangement with respect to the one or more optical devices;

an optical lens system comprising one or more optical lenses and a device bonding surface supporting a solderable metallization pattern having a spatial arrangement with respect to the one or more optical lenses, wherein the one or more optical lenses are recessed below the device bonding surface; and

a plurality of solder bumps disposed between the metallization patterns of the optical device system and the optical lens system;